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TRANSLATIONS ON EASTERN EUROPE
Economic and Industrial Affairs
(FOUO 9/79)



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CZECHOSLOVAKIA

CSR CHEMICAL INDUSTRY IN THE SIXTH FIVE-YEAR PLAN

Prague CHEMICKY PRUMYSL in Czech No 1, 1979 pp 1-4

[Article by Jiri Marcin, CSR deputy minister of industry: "CSR Chemical Industry in the Sixth Five-Year Plan"]

[Text] The development of chemical production in the CSSR is necessarily predetermined by the needs of the Czechoslovak economy in which chemicals are applied on an increasingly larger scale. The fundamental phase of this chemification--production of chemicals--is carried out by the chemical industry in the Czech and Slovak socialist republics through the implementation of development and innovation programs which constitute the key elements of the increase in chemical production in our two national republics. These programs have been adopted for the sector of crude oil processing, petrochemical production, production of organic dyes and pigments, coating materials, pure chemicals, synthetic fibers, admixtures to polymers, industrial fertilizers and pesticides, sector of wood pulp and paper, and in the sector of rubber and plastics production. This is an irreplaceable production particularly due to the specific properties of chemical products which functionally supplement other products, give them a more esthetic appearance and protect them against the corrosive influences of the atmosphere. The increased consumption of chemical products in the process of scientific-technical revolution and increase in efficiency of social labor, therefore, is absolutely indisputable and objectively necessary. The importance of chemical industry for the development of the Czechoslovak economy is borne out also by the resolution of the 15th CPCZ Congress which placed the chemical industry among the key sectors of the national economy and specified the goals which were to be attained by chemical production during the period of the Sixth Five-Year Plan. Moreover, it ordered the CSSR chemical industry by 1980 to increase production by 36-39 percent in comparison with 1975 and the CSR chemical industry specifically to increase production by Kcs 12 billion during the same period. Both national ministries of industry direct their planning, management and checks in accordance with these goals.

Within the CSR Ministry of Industry, the fulfillment of planned tasks was striven for during recent years by economic production units Chemopetrol, Unichem, Czech Rubber and Plastics Plants, Paper and Wood Pulp Industry, and Fosfa national enterprise whose extensive assortment contains a large amount of important products from the area of basic chemistry, rubber and plastics, and products of wood pulp-paper industry.

The CSR chemical industry fulfilled its tasks during the first 2 years of the Sixth Five-Year Plan while achieving 115.8 percent in the dynamic increase of production volume in comparison with the reality of 1975 (see Table 1). The tasks were fulfilled according to the plan also in 1978 with the exception of petrochemical production in which an undesirable restriction took place because of the reduced deliveries of ethylene from the GDR to the CSSR. Nevertheless, the increase in the volume of chemical production in the CSR will amount to 20.7 percent during the first 3 years of the Sixth Five-Year Plan, which unquestionably testifies to the active participation of the Czech chemical industry in the development of our economy.

Table 1. Comparison of Indicators for Chemical Industry Controlled by CSR Ministry of Industry During 1975-1980

	<u> 1975</u>	Expected reality	1978/1975 <u>Index</u>
Gross production in billion Kcs by concern method (at 1977 prices)	41.5	50.1	1.207
Labor productivity per worker in 1,000 Kcs	322.8	387.0	1.100

Much work had to be done in the Czech chemical industry during the past period. In the first place, production units were put into operation for production of low-pressure polyethylene, polypropylene and PVC, and a production unit for ABS terpolymer is also in operation at this time. Together with already previously introduced production of polysterens and butadiene-styrene rubbers, these production units represent an important production basis for the application of chemification of the national economy. The extensive assortment of natural and color types of Liten (PENT), Mosten (PP), Neralit (PVC), Krasten and Koplen (PS), Kralex (SBR) and partly also Forsan (ABS) have created and continue to create a broad material basis for a substantial reduction of imports of plastics to the CSSR and also for significant exports of these materials to the GDR, USSR, Poland and hard currency areas. This fact is documented in Table 2. Some shortcomings in quality and packaging were gradually eliminated, and the CSR chemical industry has at its disposal, in the area of petrochemical production, a modern production technical basis today whose importance will forther increase after the completion of construction of the ethylene unit which will produce domestic ethylene, propylene, benzene and C4 fractions.

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The manufacture of these plastic materials and rubbers together with the manufacture of synthetic ethylalcohol, oxoalcohols and ethylbenzene as well as the extraction unit for production of butadiene from C4 fraction represent a comprehensive petrochemical solution which will demonstrate the significance of Czech chemical industry and insure its further development. This development of the petrochemical basis has been made possible by the creative work of management collectives in the GR [general directorate] of Chemopetrol, concerned enterprises, the Research Institute for Macromolecular Chemistry in Brno and the Research Institute for Synthetic Rubber at Kralupy. It is precisely the research workers who face the task of further development of the production assortment and qualitative parameters of individual types of products. Consistent modernization is also applied in the basic processing of crude oil, production of gasolines, oils made from crude oil and other products important to the society in the New Refinery of Kaucuk Kralupy k.p. [expansion unknown], in construction of another refinery in k.p. CHZ CSSP [Czechoslovak Soviet Friendship Chemical Plants] Litvinov and in the planned construction of a refinery in northern Moravia. It is appropriate to recall in this context the effort to fulfill the tasks by the crude oil processing units at CHZ CSSP Litvinov, Koramo Kolin, Paramo Pardubice and Ostramo Ostrava which have been meeting the set targets already for a long time and must continue to attain the necessary production volume until the reconstruction of the existing unit or construction of new units is completed because the implementation of investment projects, both in terms of volume and time, has its well-known and essentially logical limitations which affect the pace of development of production capacities in all sectors of our economy.

Table 2. Import and Export of Selected Plastic Materials in the CSSR (in 1,000 tons)

	<u>1975</u>	1978	1978/1975 <u>index</u>
PENT, PEVT, PP, PVC, PS	import 111.9	48.7 143.3	0.434

Considerable effort is made by the CSR chemical industry in the preparation for and actual construction of its own production basis for organic dyes and coating materials. At the present time, production of more than 300 brands of dyes amounts to almost 13,000 tons and the programs are now defined with more precision for increased production of organic pigments, reactive coloring agents, azodyes and special coloring agents which will enrich the scope and quality of the assortment produced so far, again in order to cut down the undesirable imports of some types of dyes from the capitalist states and to expand the production technical basis within CEMA. The development of this branch of chemical production is assisted by the Research Institute for Organic Syntheses in Pardubice which pursues research and deals with the problems in all key areas of dye manufacture,

and provides the necessary documentation for the construction projects without resorting to the purchase of licenses abroad. In the area of production of coating materials also, a number of important innovations are being actively prepared among which the most important is the construction of a new plant at Hostivar which is to be started in 1979 and reconstruction of the plant at Uherske Hradiste which is to be started in 1980. At the same time, the raw materials base is being expanded particularly through the construction of a large-capacity production plant for acrylic acid and its esters which is to be started at the Sokolov Chemical Plants national enterprise in 1979. The CSR chemical industry strives also in this production branch for a comprehensive modernization and expansion of the production basis in order to bring it to the level corresponding to the requirements of progressive technology and to create conditions for the gradual reduction of imports from the capitalist states. Very active in this area is the Research Institute of Synthetic Resins and Varnishes in Pardubice and the Research Institute for Coating Materials of Dyes and Varnishes national enterprise in Prague.

Great attention is paid to the increased production of pure chemicals. The present assortment in this production area is already rather extensive and includes chemicals for laboratories, medical purposes and materials for chromatography. There is a plan for increased production of pure hydroxides and gases whose implementation, however, depends upon the investment possibilities of the Czech chemical industry in the future.

The Urx Plants national enterprise of Unichem economic production unit will start construction of the third line for production of active blacks in 1978 in order to achieve the quality rating of "Improved" and structure corresponding to the needs of the rubber industry.

In the area of fertilizer production, good results have been achieved in the manufacture of urea at CHZ CSSP, which has been placed in the first-quality class and represents a contribution of the chemical industry to the development of large-scale agricultural production. In the area of industrial fertilizers also, the Czech chemical industry supplies nitrogen, phosphoric and potash fertilizers which permit large-scale application of pure nutrients per hectare of agricultural land and unquestionably contribute to the intensification of production in this area.

Chemical plants in the CSR producing industrial fertilizers, however, face several urgent tasks among which the most important is the replacement of existing production facilities which by their parameters no longer meet the needs of large-scale socialist agricultural production. This is an urgent task for whose solution production enterprises as well as the Research Institute for Inorganic Chemistry at Usti nad Labem have been mobilized.

An important contribution also is the construction of the production unit for thermic phosphoric acid in the Fosfa national enterprise which was

supplied by the USSR and put into experimental operation in 1978. It will produce additional important substances for production of detergents and for agricultural needs.

During the Sixth Five-Year Plan, the comprehensive transition has been completed of plants producing sulfuric acid to elementary sulfur by construction of another large-capacity production plant supplied by Poland for k.p. Prerov Chemical Plants.

The products of the paper and wood pulp industry are of great importance to a further increase in the living standard. The still existing difference in the consumption of these products per capita between the industrially developed states and the CSSR motivates the main directions in the development of this important sector. A paper plant with the production line for continuous boiling of wood pulp has already been constructed in the Sepap Steti national enterprise and the construction of a production combine at Paskov is in the stage of very active preparations at the present time. The construction of a plant for corrugated cardboard has been completed in northern Moravia, paper production machinery in individual plants were and are being reconstructed, and specialization in production assortment is gradually being carried out.

The CSR rubber and plastics industry has also successfully fulfilled its tasks in the first half of the Sixth Five-Year Plan. Production is being intensified in the new tire plant of the Red October national enterprise at Otrokovice and in the Mitas national enterprise in the area of combined and steel-belted tires for trucks and for cars. In order to meet the demand for cord fabrics made of artificial silk and polyamides, CZGP [Czechoslovak Rubber and Plastics Works] has increased production in the Kordarna national enterprise at Velka nad Velickou. These are by no means insignificant tasks. They are imperative, if the CSSR is to keep pace with the foreign manufacturers of tires with which the Czechoslovak tire industry competes on foreign markets. Good results have also been achieved in the manufacture of polyurethane products by the Gumotex Breclav national enterprise which cooperates with automobile and furniture industries, although this area of production requires a considerable amount of foreign exchange. Considerable progress was made in production of rubber for industrial purposes in recent years. The transition of a section of technical rubber production from the multistage presses to the modern injection presses has made it possible to increase both labor productivity and the number of products. As a result, the CSR rubber industry was able to increase production of selected, technical rubber 28 percent during the first 3 years of the Sixth Five-Year Plan in comparison with 1975. Although further increase in this area of production will take place primarily in Slovak industry during the Seventh and Eighth Five-Year Plans, the intensification of this production must continue also in the CSR because the need of technical rubber constantly is increasing in the national economy and its adequate domestic production must be secured because its purchases in foreign countries are expensive and must be paid for in hard currency.

The enumeration of good work results in the past 3 years and some data in the tables demonstrate that the Czech chemical industry continues to explore how to increase production, although our economy cannot for objective reasons meet all demands of VHJ [economic production units] and production enterprises for investment projects, noninvestment imports, labor force, housing and other projects which unquestionably affect the state of the production tachnical basis. The area of capital construction in particular is encountering urgent problems. At the present time, the CSR chemical industry lacks suppliers in the area of both construction work and machinery and technologies. The production increase, therefore, depends to an undesirable extent on imports of machinery and equipment from the capitalist states with all the negative phenomena accompanying such imports. This situation is indisputably due to the objective reasons and particularly to the big demands of our entire economy for machinery and construction work.

Nevertheless, we cannot be satisfied with the present situation in the area of investments and ways must be found to establish closer links between the CSR chemical industry and the Czechoslovak machinery basis, primarily VHJ Chepon and others which can contribute to further development of the chemical industry in the CSR. On the other hand, we must see to it that we engage only in those projects which are indisputable and in which our own preparation corresponds to the requirements of our suppliers.

Imports were successfully reduced by the application of the results of TR [technical development] and purchase of machinery and equipment with repayable foreign exchange credits. As a result, production started of Sokrat 2.802 acrylic preparation at CHZ Sokolov, of dodecyl-benzensulfonan partly substituting for the imported fatty alcohol Alfol, substitute of photographic plate imported from the KS [capitalist states] in the Fotochema national enterprise on the basis of cooperation with the GDR. The increased production of dyes in the Association for Chemical and Metallurgical Production national enterprise compensated for 12 imported brands in the total quantity of 95 tons, replaced spermaceti oil in the production of TPP and KPP, replaced the imported n-hexan by domestic production, capacity of impregnation of fabrics in national enterprise Kordarna has been expanded as has been production of tires for rear wheels of tractors in RR [Coal Basin Directorate] national enterprise, production of suede gloves in Vulkan national enterprise, manufacture of hoses in Optimit Odry national enterprise, sealers for automobiles in Vulkan national enterprise and the system of injection pressing was applied on a large scale in Rubena, Gumokov and Zubri national enterprises. In addition, imports were reduced by manufacture of hard foils in Technoplast national enterprise, contracting foils in Granitol national enterprise and insulation foils from Fatra national enterprise. In the paper and wood pulp industry, the first stage was completed in the reconstruction of PS [expansion unknown] VII in the Vetrni plant of South Bohemian Paper Mills national enterprise resulting in the increased production and delivery of paper for the illustrated periodical KVETY; production was increased of

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wallpapers and decorating papers, notebooks for schools and industrial packaging papers. These and other measures can serve as an example of how the chemical industry should proceed in the future.

The innovation movement has registered an upswing. There has been an increase in the number of comprehensive rationalization brigades in which blue-collar workers, technicians, design engineers and management personnel try to solve the problems that affect the increase in labor productivity and represent potential sources which can be well utilized for a further increase in chemical productions and their efficiency.

The CSR chemical industry now faces the tasks of 1979 and 1980. These tasks have their internal logic and their fulfillment will further strengthen the ties between the Czech chemical industry and the entire Czechoslovak economy. In addition, the participation of the Czech chemical industry in international division of labor will increase. We face considerable tasks which represent a challenge to the knowledge and moral strength of individuals and collectives. We must, therefore, make use of all experience from the past, further develop good experience and methods, and conduct a strenuous struggle for the consistent fulfillment of all tasks which were assigned to the chemical industry by the state plan of development of the national economy.

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CZECHOSLOVAKIA

WIDER USE OF RAIN-FLOW COUNT PROGRAM URGED

Prague TECHNICKY TYDENNIK in Czech 13 Feb 79 pp 1, 2

[Article: "What Czechoslovak Improvers Are Achieving: Rain-Flow Count into a Computer"]

[Text] The durability and dependability of materials used for the production of transport and other equipment directly serving people is a very serious problem. It is presumably not necessary to stress why. Many breakdowns of transport equipment have arisen from the fact that material put under stress by changing usage was damaged. Thus from the clear blue sky a chassis frame, an auto body, or an airplane construction breaks up...

Up until now several programs which determine the distribution of the values of these processes have served for the elaboration of random processes by means of cybernetics. Then the damage is calculated by other programs. Unfortuately the results obtained in this way are due to the simplified methods used in processing the extremes of random processes, so that the durability of components is determined with significant dispersion.

The previous method of determining durability, and thereby the dependability, of materials kept one of the leading scientific workers of the Skoda specialized enterprise, leader of the research center of cybernetics of the Central Research Institute of Skoda in Plzen, Engr Miroslav Balda, Csc, from sleeping. Thus also--and it is necessary to add that it was at the impulse [impuls] of specialists from the Locomotive Engine Research Institute of CKD [Ceskomorav-ska Kolben-Danek, Heavy Engineering] in Prague that the improvement proposal with the registration number 12/15/76, entitled Set of Programs for Processing Operational Measurements with Orientation on the Calculation of Durability, was originated.

Its object is programming software (in the advanced version of the S 90 or RC 70 computers) for processing the extremes of random processes. The programs called CXH, CXF, CMG, and CMT are involved. The first of these programs carried out a three-parameter analysis of a half-cycle of random processes with optional insensitivity. It processes the numerical re rds into three-dimensional histograms of extremes following one after another, plots their graphs, carries out a frequency analysis of minima and maxima, of

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reduced extremes, average values, and frequency swings, and compiles three-dimensional histograms which express the distribution of the frequencies of average values and the amplitudes of stress in frequencies. In particular the area of frequencies is a very important datum. And them from them it calculates a three-dimensional matrix of damage and the consequent overall damage of material. Besides this, the CXH program carries out the same operation by the so-called method of paired frequency swings.

The second program—CFX—analyzes full cycles of random processes by a method known under the name of rain—flow count, about which it is stated in literature throughout the world that it is not programmable. This program, which Engr M. Balda proved is programmable, allows the frequency analysis of complete cycles of extremes through their calculation into three-dimensional historgrams, and also the frequency analysis of cycles on rising branches and falling branches (the method of "rain—flow count" is graphically des—cribed as branches of a tree), of the difference of both means and frequency swings, and furthermore several similar operations as in program CXH. With these two programs, which form the core of the set, are allied the CMG program (for sampling random processes, the generation and pre-elaboration of a tape) and CMT program (for the operational abstract of the content of a magnetic tape).

The proposal has been already used successfully for more than a year in CKD, in Prague, in the Skoda specialized enterprise, and in other work places.

What does its author say? "We can attain the greatest savings clearly with the utilization of program CFX, because it involves a unique program never developed before. The processing of the extremes of random processes by manual sample-taking requires about 10 seconds per sample. The ordinary task has about 10,000 to 100,000 samples, and the diligent, clever worker would take about 10 work days, for instance, to make 28,000 samples. The manual processing by the method of rain-fall count would require roughly 250 hours of work by a qualified worker for 100,000 samples. The processing of a task of 65,000 samples took the computer 31 seconds, i.e., it worked with a speed of 2,000 samples per second. This makes a saving of around Kcs 1,565 per 1,000 samples."

The numerical processing of extreme random processes, which is actually the most modern contemporary preventive method in assuring durability of materials, has an undeniable future. In specialized opinions, it is said that this actually involves a unique program or set of programs which has no equivalent in the CSSR, and it is possible to say that the applicability of this product is not limited to our republic alone. It can be stated that without the introduction of this improvement proposal it would be impossible to make calculations of durability during the random stationary stressing of machines. This is so far as the research of machines in the Skoda specialized enterprise is concerned. But this set of programs, as has already been mentioned, is being used primarily in research and production of locomotives in CKD, in the Plzen plant of Electric Locomotive, and in other plants of the

enterprise, and also outside the enterprise in the Slovak Academy of Sciences-Institute of Machine Mechanics; cooperation has been entered into with the Institute for Light Construction in Dresden, and there are possibilities for using it also in other areas and specialties, especially in the aircraft industry.

The total annual savings is Kcs 784,000. This year it should be substantially higher.

Savings arising from the protection of equipment cannot even be enumerated.

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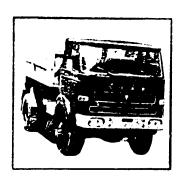
POLAND

THE 'STAR' AND 'NYSA' POLISH MOTOR VEHICLES

Alma-Ata AVTOMOBIL'NYY TRANSPORT KAZAKHSTANA in Russian No 1, 1979 pp 46-47

[Article by E. Denicenko: "The 'Star' and 'Nysa'"]

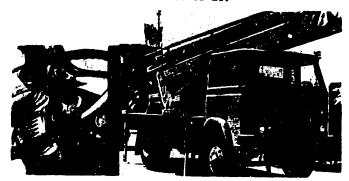
[Text] One can encounter domestically produced motor vehicles of the most diverse types and production quantities on the highways of Poland today. Here there are the "Varshav's, and the "Siren's", and the "Zhuk's", and the "Sel'ch's", and the "Fiats." But perhaps, most of all the "Star" trucks and the "Nysa" microbuses and vans. They are produced by the motor vehicle plants located in Starakhovitsy and in Nysa. This is where they get their names.



The production program of the former is rather extensive and encompasses a wide range of motor vehicles with load capacities from 3.5 to 6 tons. The basic models are considered the "Star-28" diesel five ton truck (see the photo) and the "Star-29" with a similar load capacity, which is equipped with a carburetor type S47A engine with a power of 104 HP rated in accordance with German Industrial Standards. A five speed transmission without a synchronizer is installed in both models. The cab is a two-seater, enlosed and the area of the load bed is about 10 square meters. Each of the "Stars" can tow a trailer with an overall weight of 5,250 kg.

The overall dimensions of the motorvehicles are as follows: the length is 6,430 mm, the width is 2,380 mm and the height is 3,000 mm. Both the diesel and the carburetor models are equipped with a fuel tank having a capacity of a 150 liters. The "Star-28" uses 21 liters of fuel (diesel oil) per 100 trip kilometers, while the "Star-29" uses 37.5 liters (gasoline with an octane rating of 79). The maximum speed which these motor vehicles develop with the indicated types of engines is approximately the same and amounts to 80 km/hr.

The "Star-200" is also included among the base models, and has a load capacity of six tons. Just as the "Star-28", it is equipped with a diesel engine, but the power is 50 HP greater. The presence of a synchronizer in the transmis sion is yet another distinctive feature of it.



Besides the basic variants, the truck plant in Starakhovitsy produces a twin-axle model with increased rough-road performance (the "Star-244") with drive to all wheels, as well as the "Star-256" three-axle cross country vehicle, equipped with a hydraulic servo mechanism for the steering and a reversible winch. When travelling over dirt roads, it can haul up to three tons of cargo, while its load capacity on the highway is four tons. In the second case, a provision is also made for towing a four-ton trailer.



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Polish industry is also producing a number of special purpose motor vehicles on the chassis of the basic models of the Starakhovitsy motor vehicle plant: a truck tractor, a crane, a dump truck, a fire truck, etc. One of these is shown in the photo.

The manufacturer of the next model, in this case the "Nysa-522", is a plant for small cargo capacity trucks, which is located in the city which gave the name to its own product. An entire family of motor vehicles, equipped with carburetor engines, such as in the "Zhuk" motor vehicle (see Journal No. 12 for 1978) is coming off of its conveyor line. Motor vehicle drivers are well-acquainted with them, since, as is well known, our country is one of the main consumers of Polish vans and microbuses of the "Nysa" make. In over more than decades of exporting them to the USSR, more than 50,000 vehicles have been sent.

The "Nysa-522" is one of the special purpose models. The maximum power of the engine installed in it is 70 HP at 4,000 r.p.m. On the road, it can develop a speed of 95 km/hr. The cab for the driver and the passenger compartment are metal, while the cargo bed is made of wood with a flat floor and sides which can open up. The "Nysa-522" can carry five persons and 525 kg of cargo or one passenger and about a ton of cargo.

The products of the motor vehicle plant in Nysa enjoy considerable demand in the national economy.

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